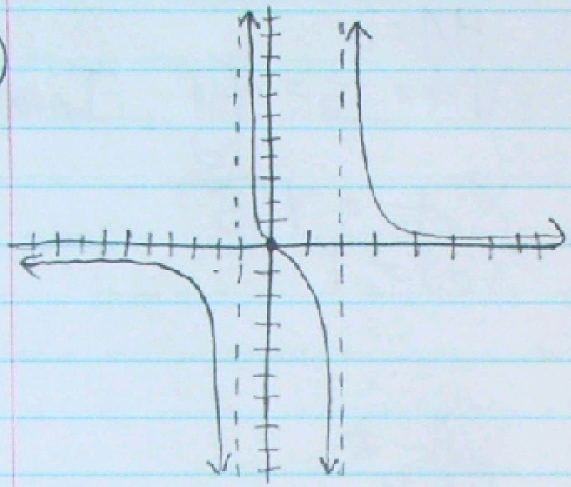
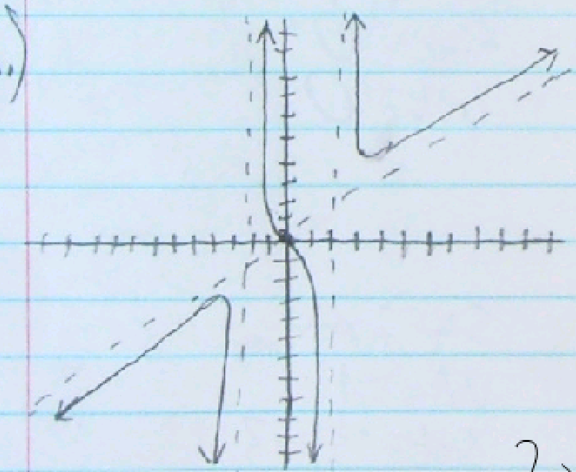
a.)



HA = 0
VA = -1, 2
Xint = 0
Yint = 0

$$f(x) = \frac{3x}{x^2 - x - 2}$$

b.)



SA = .5x
VA = 2, -2
HA = Non-existant
Xint = 0
Yint = 0

$$f(x) = \frac{x^3}{2x^2 - 8}$$

$$\frac{1}{2}x + \frac{4}{2x^2-8}$$

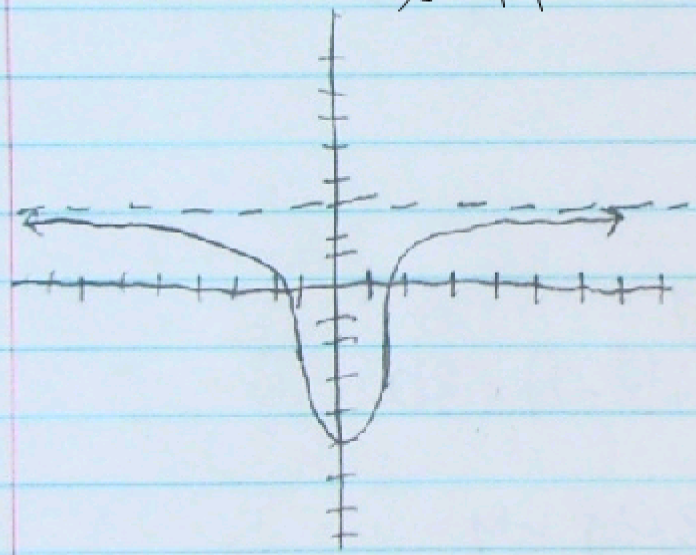
$$2x^2 + 0x - 8 \;\overline{\big)\, x^3 + 0x^2 + 0x + 0}$$

$$\underline{x^3 + 0x^2 - 4x}$$

$$4x + 0$$

$f(x) = \frac{3x^2 + x - 5}{x^2 + 1}$

c.



$HA = 3$

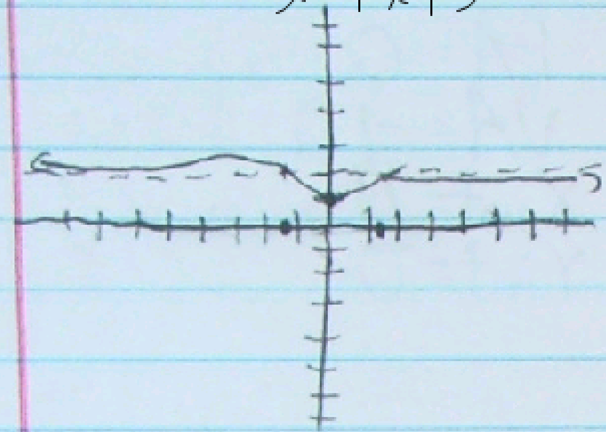
$VA = i, -i$ – No vert. asympt

$X_{int} = -\frac{1}{6} \pm \frac{\sqrt{61}}{6}$

$Y_{int} = -5$

$f(x) = \frac{2x^2 + 3}{x^2 + x + 3}$

d.)



$HA = 2$

$VA = -\frac{1}{2} \pm \frac{\sqrt{-11}}{2}$ = Imaginary

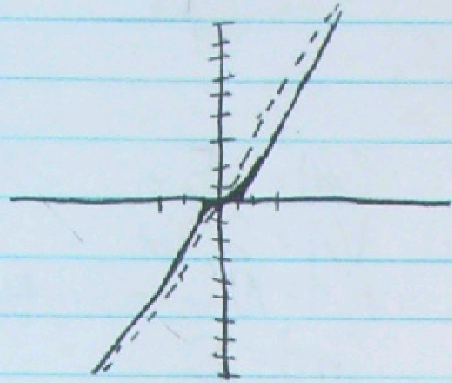
No vert. asympt.

$X_{int} = \pm\sqrt{1.5}$

$Y_{int} = 1$

$$f(x) = \frac{2x^3}{x^2+1}$$

e)

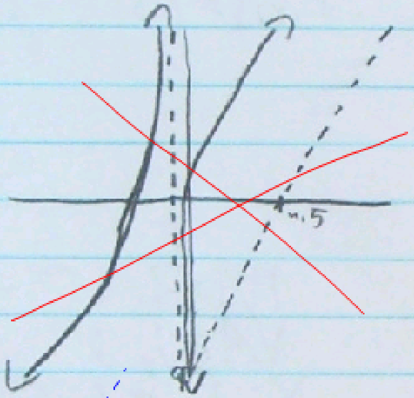


SA = 2x
VA = i, -i
$X_{int} = 0$
$Y_{int} = 0$

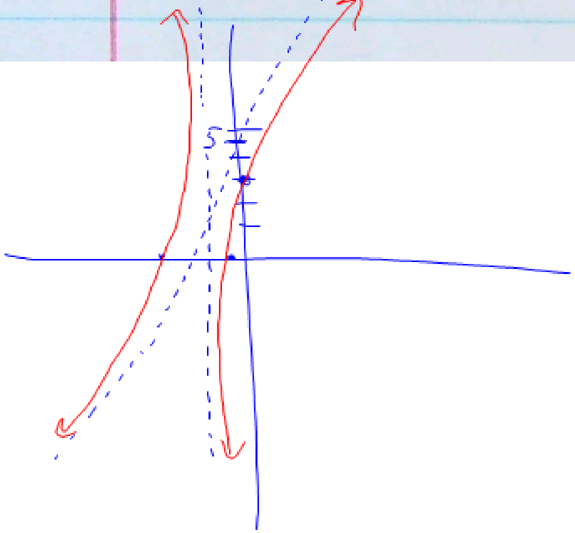
f)

$$f(x) = \frac{2x^2+7x+3}{x+1}$$

$(2x+1)(x+3)$



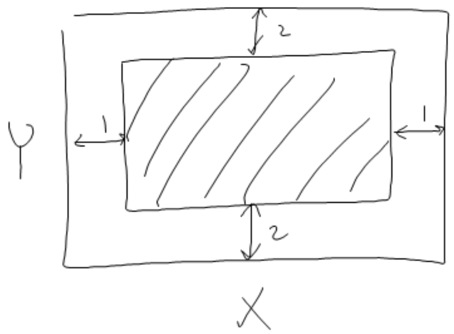
SA = 2x - 9
VA = -1
$X_{int} = -\frac{1}{2}, -3$
$Y_{int} = 3$



$$2x + 5 + \frac{-2}{x+1}$$

$$
\begin{array}{r|l}
x+1 & 2x^2 + 7x + 3 \\
 & 2x^2 + 2x \\
\hline
 & 5x + 3 \\
 & 5x + 5 \\
\hline
 & -2
\end{array}
$$

Station 7



$30 = (x-2)(y-4)$

$\frac{30}{x-2} = y-4$

$y = \frac{30}{x-2} + 4 \quad \frac{(x-2)}{x-2}$

$y = \frac{30 + 4(x-2)}{x-2}$

$y = \frac{30 + 4x - 8}{x-2}$

$y = \frac{4x+22}{x-2}$

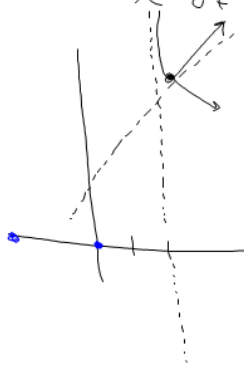
$A = xy$

$A = x\left(\frac{4x+22}{x-2}\right)$

(a) $\boxed{A = \frac{4x^2+22x}{x-2}}$

(b) Domain $x > 2$ because of margins

(c)

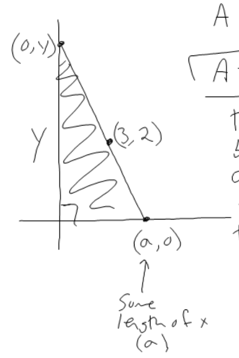


$x = 5.87$

Slant

$$\begin{array}{r|l} & 4x + 30 \\ \hline x-2 & 4x^2 + 22x \\ & 4x^2 - 8x \\ \hline & 30x + 0 \\ & 30x - 60 \end{array}$$

Station 8)



$A = \frac{1}{2} b \cdot h$

$\boxed{A = \frac{1}{2} x \cdot y}$

The base will be the length along the x-axis

the height is the y-value

We need to find an equation to link x + y

use the point slope form for the line

$y = m(x - x_1) + y_1$

So we need to find m first

To find m use (3,2) (x,0). But since we have an x for our independent variable already, let's use the letter "a" to denote the specific x-value. So our points are (3,2) and (a,0). The slope is then $m = \frac{2-0}{3-a} = \frac{2}{3-a}$

and we can put that back into the point slope equation using the point (a,0) which is what we ultimately want to find. $y = \frac{2}{3-a}(x-a) + 0$ or $y = \frac{2}{3-a}(x-a)$

Now plug back into the original equation $A = \frac{1}{2}xy$ using what we just found as the y, and "a" for x to stay consistent $A = \frac{1}{2}a\left(\frac{2(x-a)}{3-a}\right)$. Now the key is

that the height or y-value corresponds to an x-value of zero so we have

$$A = \frac{1}{2}a\left(\frac{2(0-a)}{3-a}\right)$$

$$A = \frac{1}{2}a\left(\frac{-2a}{3-a}\right)$$

$$\boxed{A = \frac{-a^2}{3-a} \quad \text{or} \quad \frac{a^2}{a-3}}$$

Graphing we find the minimum value for A is 12 when a = 6.

Test – No Calc.

→ 3 problems like station 6

- Vert. Asympt.
- Horz. Asympt.
- Slant Asympt.
- x-int.
- y-int.
- holes

→ 2 application problem